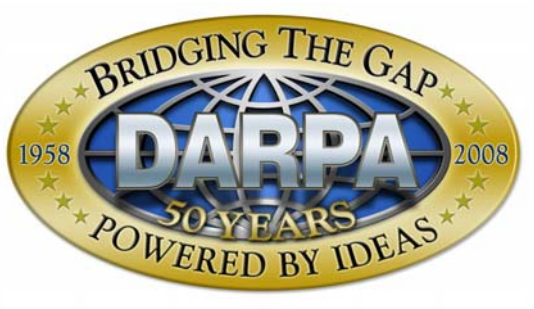
Defense Advanced Research Projects Agency (DARPA)

Broad Agency Announcement 07-39

Micro Space Propulsion (MSP)



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Part One: Overview Information

- **Federal Agency Name:** Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office
- **Funding Opportunity Title:** Micro Space Propulsion (MSP)
- **Announcement Type:** Initial Announcement
- **Funding Opportunity Number:** Broad Agency Announcement (BAA) 07-39
- **Catalog of Federal Domestic Assistance Numbers (CFDA):** N/A
- **Dates:**
  Industry Day: September 21, 2007
  Proposal Abstract Due Date: October 3, 2007
  Proposal Due Date: November 14, 2007
- **Total amount of money to be awarded:** Program funding level will be established based upon the strength of the individual proposals and other relevant factors.
- **Anticipated individual awards:** Multiple awards are anticipated. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.
- **Types of instruments that may be awarded:** Proposals identified for funding may result in a procurement contract, grant, cooperative agreement, or other transaction depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors. If warranted, portions of resulting awards may be segregated into pre-priced options.
- **Any cost sharing requirements:** None
- **Agency contact:**
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Part Two: Full Text of Announcement

I. FUNDING OPPORTUNITY DESCRIPTION

The Defense Advanced Research Projects Agency often selects its research efforts through the Broad Agency Announcement (BAA) process. The BAA will appear first on the FedBizOpps website, http://www.fedbizopps.gov/, and Grants.gov website at http://www.grants.gov/. The following information is for those wishing to respond to the BAA.

DARPA is soliciting innovative research proposals in the area of Micro Space Propulsion (MSP). Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems that enable demonstration of a prototype that meets program goals. Specifically excluded is research that primarily results in evolutionary improvements to the existing state of practice, or research that primarily results in theoretical data or devices suitable only to laboratory usage.

Space is being used to fulfill an ever increasing range of both civilian and military needs. There is increasingly a desire to deploy satellites and spacecraft whose missions and requirements may be changed routinely throughout their operational life to support changing national needs.

The Specific Impulse (Isp) of a propulsion system is a measure of its fuel efficiency – specifically impulse (proportional to change in velocity) generated per unit weight of propellant. For chemical propulsion systems, a higher specific impulse is almost always desirable. However, chemical propulsion systems are generally limited to Specific Impulses much less than 1000 s.

Electrical propulsion systems can achieve Specific Impulses as much as ten times larger. However, as Isp is increased, the power required to achieve a given level of thrust, and thus a given maneuver time, also increases. Thus, using electric propulsion, there is an optimal specific impulse for each maneuver that allows the spacecraft to complete the maneuver in the required period of time, using available power, while minimizing expenditure of propellant.

Currently, electric propulsions systems are limited in their ability to vary Isp while on-flight. Tasking the satellite to do a maneuver other than it was designed for is either beyond the capability of the spacecraft (e.g. insufficient power and thrust), or extraordinarily wasteful of precious propellant (insufficient specific impulse). It is the aim of the BAA to create electric propulsion systems with extraordinarily wide Isp dynamic range (500 s – 10,000 s), thus enabling spacecraft to efficiently respond as mission requirements evolve.

The structure of this BAA presumes that offerors will propose Field Effect Electric Propulsion (FEEP) or Colloid propulsion systems. Offerors who believe that they can

meet the objectives of this BAA utilizing an alternate strategy should contact the program manager.

The MSP program is envisioned to occur in four phases, as described below. As noted below, the aggressiveness of the proposed effort, in terms of the time it takes to complete program objectives, will be a key evaluation criterion. Shorter phase durations are preferred. Phases do not need to be of uniform length but are provided as waypoints for evaluating progress. Any phase longer than 12 months must be divided in sub-phases with specific measurable milestones for each sub-phase, so as to enable periodic review.

Phase I: Demonstration of repeatable emitter array operation: The objective of Phase I is to demonstrate one or more arrays of micro-emitters (thrusters), each comprising 25 or more individual emitters, that demonstrate (1) controlled, repeatable emission; (2) operation at both 500 s Isp and >2000 s Isp; and (3) >10% wall-plug thrust efficiency. For Phase I, different emitter arrays may be used for the two Isp ranges. Controlled and repeatable operation shall be defined by the offeror, but should include (1) greater than 100 on-off cycles, (2) an operational lifetime of greater than 16 hours of cumulative operation, and (3) ten or more exposures to atmosphere or oxygen-containing environments.

Phase II: Variable Isp emitter array performance. The objective of Phase II is to demonstrate on-the-fly adjustability of Isp from emitter arrays. The demonstration array should (1) comprise 25 or more individual emitters, (2) demonstrate on-the-fly adjustable Isp from 500s-10,000s; and (3) have a wall-plug efficiency of 50% or greater. Use of a single emitter array over the entire Isp range is preferred. However, multiple emitter arrays may be used if they can be readily integrated into a compact thruster system using a single propellant.

Phase III: Scaling and demonstration of thruster system. The objective of Phase III is to (1) maintain on-the-fly adjustable Isp from 500s-10,000s; (2) scale the unit cell to demonstrate one Watt total input power at 70% efficiency (i.e. equivalent 700 mW thrust); and (3) to integrate said emitter array into a complete prototype thruster system (including power processing unit, propellant feed, etc.).

Phase IV: High-thrust / High-efficiency thrusters. The objective of this Phase is to scale up the emitter system demonstrated in Phase III to 100 Watts input power at 90% wall-plug efficiency (i.e. equivalent 90 Watts thrust). DARPA recognizes that 90% efficiency may not be theoretically possible at 500 s. Proposers should clearly delineate their ultimate performance target as a function of specific impulse.

The above phase goals are summarized in Table 1.

	Phase I	Phase II	Phase III	Phase IV
Challenge	**Unit Cell**		**System demonstration Scaling**	
	Operation	**Performance**		
Duration	TBD*	TBD*	TBD*	TBD*
Emitters	25+	25+	As needed	As needed
Power	N/A	N/A	1 W	100 W
Isp Range	Repeatable** emission > 2000 s	500s – 10,000 s (on-the-fly adjustable)		
	Repeatable** emission 500 s			
Efficiency* **	10%	50%	70%	90%****

* Phase duration to be determined by offerors, and will be used as a section criterion.

** For example, >100 on-off cycles, >16 hours of operation, >10 exposures to oxygen containing environment.

*** Electrical thrust efficiency, η_t, is defined as: $\eta_t = (FI_s g_o)/2P_e$, where F is the thrust generated by the thruster, Is is the specific impulse, go is the acceleration of gravity, and Pe is the wall-plug power input to the thruster (see for example Sutton, G.P., and Biblarz, O., Rocket Propulsion Elements, John Wiley and Sons, New York, NY, 2001, pg. 665).

**** Depending on approach, 90% efficiency may not be theoretically possible at 500 s Isp. Offerors should define the efficiency they expect to obtain, and seek to approach theoretical efficiency, to the extent possible.

Table 1. Program Metrics

II. AWARD INFORMATION

Multiple awards are anticipated. The amount of resources made available under this BAA will depend on the quality of the proposals received and the availability of funds.

The Government reserves the right to select for negotiation all, some, one, or none of the proposals received in response to this solicitation, and to make awards without discussions with offerors. The Government also reserves the right to conduct discussions if the Source Selection Authority later determines them to be necessary. If warranted, portions of resulting awards may be segregated into pre-priced options. Additionally, DARPA reserves the right to accept proposals in their entirety or to select only portions of proposals for award. In the event that DARPA desires to award only portions of a proposal, negotiations may be opened with that offeror. If the proposed effort is inherently divisible and nothing is gained from the aggregation, offerors should consider submitting it as multiple independent efforts. The Government reserves the right to fund proposals in phases with options for continued work at the end of one or more of the phases.

Awards under this BAA will be made to offerors on the basis of the evaluation criteria listed below (see section labeled "Application Review Information", Sec. V.), and program balance to provide overall value to the Government. Proposals identified for negotiation may result in a procurement contract, grant, cooperative agreement, or other transaction depending upon the nature of the work proposed, the required degree of interaction between parties, and other factors.

III. ELIGIBILITY INFORMATION

A. Eligible Applicants

All responsible sources capable of satisfying the Government's needs may submit a proposal that shall be considered by DARPA. Historically Black Colleges and Universities (HBCUs), Small Businesses, Small Disadvantaged Businesses and Minority Institutions (MIs) are encouraged to submit proposals and join others in submitting proposals; however, no portion of this announcement will be set aside for these organizations' participation due to the impracticality of reserving discrete or severable areas of this research for exclusive competition among these entities. Independent proposals from Government/National laboratories may be subject to applicable direct competition limitations, though certain Federally Funded Research and Development Centers are excepted per P.L. 103-337§ 217 and P.L 105-261 § 3136.

Foreign participants and/or individuals may participate to the extent that such participants comply with any necessary Non-Disclosure Agreements, Security Regulations, Export Control Laws, and other governing statutes applicable under the circumstances.

B. Ethical Considerations, Procurement Integrity, and Organizational Conflicts of Interest

Certain post-employment restrictions on former federal officers and employees may exist, including special Government employees (including, but not limited to, Title 18, Section 207, United States Code, the Procurement Integrity Act, 41 U.S.C. 423, and FAR 3.104.) Current federal employees are prohibited from participating in particular matters involving conflicting financial, employment, and representational interests (18 USC 203, 205, and 208.) Prior to the start of proposal evaluations, the Government will assess whether any potential conflict of interest exists in regards to the DARPA Program Manager, as well as those individuals chosen to evaluate proposals received under this BAA. The Program Manager is required to review and evaluate all proposals received under this BAA and to manage all selected efforts. *The Program Manager for this BAA is a former officer of Microfabrica, Inc., and, as such, is highly likely to have a conflict of interest with respect to proposals utilizing that firm as a performer. Proposers should carefully consider the composition of their performer team before submitting a proposal to this BAA.*

All Proposers and proposed subcontractors must affirm whether they are providing scientific, engineering, and technical assistance (SETA) or similar support to any DARPA technical office(s) through an active contract or subcontract. All affirmations must state which office(s) the Proposer supports and identify the prime contract numbers. Affirmations shall be furnished at the time of proposal submission. All facts relevant to the existence or potential existence of organizational conflicts of interest (FAR 9.5) must be disclosed. The disclosure shall include a description of the action the Proposer has taken or proposes to take to avoid, neutralize, or mitigate such conflict. In accordance

with FAR 9.503 and without prior approval or a waiver from the DARPA Director, a Contractor cannot simultaneously be a SETA and Performer. Proposals that fail to fully disclose potential conflicts of interests and include an effective mitigation plan, or that do not include a mitigation plan at all, will be returned without technical evaluation and withdrawn from further consideration for award.

If a prospective Proposer believes that any conflict of interest exists or may exist (whether organizational or otherwise), the Proposer should promptly raise the issue with DARPA by sending Proposer contact information and a summary of the potential conflict by email to the mailbox address for this BAA at BAA07-39@darpa.mil, before time and effort are expended in preparing a proposal and mitigation plan. If, in the sole opinion of the Government after full consideration of the circumstances, any conflict situation cannot be effectively mitigated, the proposal may be returned without technical evaluation and withdrawn from further consideration for award under this BAA.

C. Cost Sharing/Matching

Cost sharing is not required for this particular program; however, cost sharing will be carefully considered where there is an applicable statutory condition relating to the selected funding instrument (e.g., for any Other Transactions under the authority of 10 U.S.C. § 2371). Cost sharing is encouraged where there is a reasonable probability of a potential commercial application related to the proposed research and development effort.

D. Collaborative Efforts

Collaborative efforts/teaming are encouraged. A website (http://www.davincinetbook.com/teams) has been established to facilitate formation of teaming arrangements between interested parties. Specific content, communications, networking, and team formation are the sole responsibility of the participants. Neither DARPA nor the Department of Defense (DoD) endorses the destination web site or the information and organizations contained therein, nor does DARPA or the DoD exercise any responsibility at the destination. This website is provided consistent with the stated purpose of this BAA.

IV. APPLICATION AND SUBMISSION INFORMATION

A. Address to Request Application Package

This solicitation contains all information required to submit a proposal. No additional forms, kits, or other materials are needed. This notice constitutes the total BAA. No additional information is available, nor will a formal Request for Proposal (RFP) or additional solicitation regarding this announcement be issued. Requests for same will be disregarded.

Additional information may be provided, or this BAA may be amended, at any time. Potential offerors are strongly encouraged to monitor FedBizOpps for release of such information.

B. Submission Guidelines

Proposals and proposed abstracts may not be submitted by fax or e-mail; any so sent will be disregarded.

1. Abstracts

DARPA/MTO will employ an electronic upload process, the Technical Financial Information Management System (T-FIMS) Proposal Submission System, for all abstract submissions to this BAA. Electronic abstracts should be in Microsoft Word or PDF format. Proposal slides should be in Microsoft PowerPoint format. All files should be submitted via a web site interface: Web Site: https://www.tfims.darpa.mil/baa. Please note that abstracts should not be submitted via Grants.gov. DARPA will acknowledge receipt of the submission and assign a control number that should be used in all further correspondence regarding the proposal abstract.

2. Full Proposals

Proposals should be submitted electronically using one of the following two submission methods. Note that neither dual submissions nor a paper copy are required.

a. TFIMS Submission

DARPA/MTO will employ an electronic upload process, the Technical Financial Information Management System (T-FIMS) Proposal Submission System, for proposal submissions to this BAA. Proposal documents should be in Microsoft Word format or PDF format. Proposal slides should be in Microsoft PowerPoint format. All files should be submitted via a web site interface: Web Site: https://www.tfims.darpa.mil/baa.

b. Grants.gov submission

Offerors may elect to use the Grants.gov APPLY (http://www.grants.gov/) function if the applicant is seeking a grant or cooperative agreement. The APPLY function replaces the proposal submission process that other offerors follow. The APPLY function does not affect the proposal content or format. The APPLY function is electronic; offerors do not submit paper proposals in addition to the Grants.gov APPLY electronic submission.

C. Proposer Registration

Organizations planning to submit proposals and/or abstracts via T-FIMS must register at: http://www.tfims.darpa.mil/baa. Only the lead or prime organization should register. One registration per proposal should be submitted. This means that an organization wishing to submit to multiple technical topic areas should complete a single registration for each proposal. The proposer makes no commitment to submit by registering. Please note that it is recommended that proposers register on T-FIMS at least a week prior to the submission deadline to allow sufficient time for completing the registration process and uploading the submission. Please also note that proposers will receive a confirmation e-mail generated from the T-FIMS electronic system as receipt that their proposal has been received.

The T-FIMS Proposal Submission System supports the following file formats: Portable Document Format (PDF), Word Document (doc), Plain Text (txt), Comma-separated I-7 Values (CSV), PowerPoint Presentation (ppt), Excel Worksheet (xls), and Excel Workspace (xlw). Proposal submissions made through the T-FIMS Proposal Submission System must be no larger than 50 megabytes per file.

All material submitted electronically must be UNCLASSIFIED. Please DO NOT attempt to submit a CLASSIFIED material proposal through an electronic upload process as this is PROHIBITED. Offerors that intend to include classified, or potentially classified, information or data as part of their proposals shall submit an UNCLASSIFIED PROPOSAL referring to a classified annex. The offeror should contact the Technical POC for this BAA, or the Security POC cited below, for guidance on submitting the classified annex.

D. Content and Form of Application Submission

The typical proposal should express a consolidated effort in support of one or more related technical concepts or ideas. Disjointed efforts should not be included into a single proposal.

1. Proposal Abstracts

Proposers are strongly encouraged to submit a proposal abstract in advance of a full proposal. This procedure is intended to minimize unnecessary effort in proposal preparation and review. The time and date for submission of proposal abstracts is specified in Section C below.

Proposal abstracts should comprise three elements:

1. A single Penta-Chart, as described below under Full Proposals,
2. A cover sheet, as described under Full Proposals (Volume I, Section IA), and
3. A proposal summary including up to 5 pages of material, in a format of the submitters choosing, intended to convey the approach to be proposed in the full proposal.

Preferably, the coversheet and proposal summary will be submitted in a single file. All pages shall be formatted to print on 8-1/2 by 11 inch paper with type not smaller than 12 point. All proposal abstracts must be written in English. Proposal Abstracts not meeting the format described in the BAA may not be reviewed

Upon review, DARPA will provide written feedback on the likelihood of a full proposal being selected and the time and date for submission of a full proposal, which may differ from the originally published date below.

2. Full Proposals

All full proposals must be in the format given below. Nonconforming proposals may be rejected without review.

Full proposals will consist of three files:

1. A single Penta-chart. (PowerPoint format)
2. Volume I: Technical and Management Proposal (Word or PDF format)
3. Volume II: Cost Proposal (Word or PDF format)

All pages shall be formatted to print on 8-1/2 by 11 inch paper with type not smaller than 12 point.

a. Penta-Chart

Performers should provide a Microsoft PowerPoint Penta-chart using the powerpoint template provided as Attachment 1 to this solicitation. The slide should include the following elements:

1. The name of the lead organization in the slide title.
2. In the upper left section (Team), a list of the lead organization (prime), and all subcontractors. Provide logos for each team member with that of the prime contractor circled in green.
3. In the upper right section (Technical Approach), provide a summary of the technical approach that will be used to meet the program objectives, including a list of the key innovative claims for the proposed research. Provide a few simple graphics that complement the textual description.

4. In the lower left section (Performance Metrics), provide a table or graphic listing the key performance objectives by phase and sub-phase (if appropriate).
5. In the lower center section (Transition Path), describe the transition plans, including specific military insertion targets and potential commercial applications. Plans for "large-scale" manufacture should also be addressed.
6. In the lower right section (Budget/Schedule), provide total number of months and total funding required for the entire effort. Then, break the effort down phase-by-phase, outlining months, funding requirement, and major deliverables for each phase.

b. Volume I, Technical and Management Proposal

Volume I, Technical and Management Proposal, may include an attached bibliography of relevant technical papers or research notes (published and unpublished) which document the technical ideas and approach upon which the proposal is based. Copies of not more than three (3) relevant papers can be included with the submission. The bibliography and attached papers are not included in the page counts given below. The submission of other supporting materials along with the proposals is strongly discouraged and will not be considered for review. The page limitation for full proposals includes all figures, tables, and charts. Volume I Section II shall not exceed fifty pages. Maximum page lengths for each section are shown in braces { } below. All full proposals must be written in English.

Section I. Administrative

A. Cover sheet to include:
   (1) BAA number
   (2) Lead Organization Submitting proposal
   (3) Type of business, selected among the following categories: “LARGE BUSINESS”, “SMALL DISADVANTAGED BUSINESS”, “OTHER SMALL BUSINESS”, “HBCU”, “MI”, “OTHER EDUCATIONAL”, OR “OTHER NONPROFIT”
   (4) Contractor’s reference number (if any)
   (5) Other team members (if applicable) and type of business for each
   (6) Proposal title
   (7) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available)
   (8) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available), total funds requested from DARPA, and the amount of cost share (if any) and
   (9) Date proposal was submitted.

B. Official transmittal letter.

Section II. Proposal Detail

A. {3} **Executive Summary.** This should clearly and concisely summarizes the following:
   - The summary of the end-of-program performance goals and the milestones associated with each Phase of the development effort. The milestones and performance goals should be listed in a single table.
   - An explanation of how the above goals and milestones compare to what has already been demonstrated.
   - A summary of the key challenges that must be addressed, in each phase, to achieve performance goals building upon what has already been demonstrated.
   - A summary of the unique approaches and technical solutions proposed.

B. {8} **Innovative claims for the proposed research.** This section is the centerpiece of the proposal and should succinctly describe the uniqueness and benefits of the proposed approach relative to the current state-of-art alternate approaches.

C. {1} **Metrics**. Provide a table of metrics that may be used as go-/no-go metrics for each phase of the research effort. If a phase is broken into sub-phases, include go-/no-go metrics for each sub-phase. This table should include, at a minimum, those metrics outlined in Table 1.

D. {8}**Technical rationale**, technical approach, and constructive plan for accomplishment of technical goals in support of innovative claims and production of deliverable. This section should provide at a minimum (1) a detailed discussion outlining the basis for performance predictions; and (2) a description of what will be accomplished technically during each phase and sub-phase to achieve the progressive changes in performance. Where possible, this section should make reference to previous experimental results, results described in the literature, or basic physical arguments.

E. {5} **Cost, schedule and milestones** for the proposed research. Include a program schedule designed to meet milestones outlined in Table 1. Break any phase that is longer than 12 months into sub-phases, with specific measurable milestones for each sub-phase. Include a budget indicating proposed expenditure by performer for each phase and sub-phase. Note any cost share, if applicable. Include a work breakdown statement indicating the tasks to be performed by each contractor and subcontractor in each phase and sub-phase.

F. {2} **Test Plan**. Include a test plan and/or strategy conceived so as to convincingly demonstrate achievement of program and project milestones as outlined in Table 1, and proposed go-/no-go metrics listed in Section IIC8 (above). A credible test plan should include information on test system limits (minimum and maximum thrust) and resolution. Use of third-party testing is strongly encouraged.

G. {11} **Statement of Work (SOW)** A document written in plain English, outlining the scope of the effort (by Phase) and citing specific tasks to be performed, contractor requirements, and data and/or material deliverables.

H. {3} **Technology Transition**. Plans and capability to accomplish technology transition and commercialization. Include all proprietary claims to results, prototypes, intellectual property, or systems supporting and/or necessary for the use of the research, results, and/or prototype. If there are no proprietary claims, this should be stated. (See also Section VI, B(2) "Intellectual Property")

I. {5} **Team**. Provide a clearly defined organization chart for the program team. In addition, provide information describing (1) the programmatic relationship of team members; (2) the unique capabilities of team members; (3) the task responsibilities of each team member; and (4) biographies for key personnel. Include any formal teaming agreements which are required to execute this program. Include information on how the team will form fire-walls to prevent violation of export regulations, if necessary.

J. {2} **Facilities.** Describe the facilities that would be used for the proposed effort. Include information relating to laboratory certifications or accreditations needed to perform research on this program.

K. {2} **Accomplishments.** Discuss proposer's previous accomplishments and work in this or closely related research areas.

Section III. Additional Information

A brief bibliography of relevant technical papers and research notes (published and unpublished) which document the technical ideas upon which the proposal is based. Copies of not more than three (3) relevant papers can be included in the submission.

c. Volume II, Cost Proposal – {No Page Limit}

A cover sheet to include:
(1) BAA number;
(2) Technical area;
(3) Lead Organization Submitting proposal;
(4) Type of business, selected among the following categories: "LARGE BUSINESS", "SMALL DISADVANTAGED BUSINESS", "OTHER SMALL BUSINESS", "HBCU", "MI", "OTHER EDUCATIONAL", OR "OTHER NONPROFIT";
(5) Contractor's reference number (if any);
(6) Other team members (if applicable) and type of business for each;
(7) Proposal title;

(8) Technical point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), electronic mail (if available);
(9) Administrative point of contact to include: salutation, last name, first name, street address, city, state, zip code, telephone, fax (if available), and electronic mail (if available);
(10) Award instrument requested: cost-plus-fixed-free (CPFF), cost-contract—no fee, cost sharing contract – no fee, or other type of procurement contract (specify), grant, cooperative agreement, or other transaction;
(11) Place(s) and period(s) of performance;
(12) Total proposed cost separated by basic award and option(s) (if any);
(13) Name, address, and telephone number of the offeror's cognizant Defense Contract Management Agency (DCMA) administration office (if known);
(14) Name, address, and telephone number of the offeror's cognizant Defense Contract Audit Agency (DCAA) audit office (if known);
(15) Date proposal was prepared;
(16) DUNS number;
(17) TIN number; and
(18) Cage Code;
(19) Subcontractor Information; and
(20) Proposal validity period.

Detailed cost breakdown to include: (1) total program cost broken down by major cost items (direct labor, including labor categories; subcontracts; materials; other direct costs, overhead charges, etc.) and further broken down task and phase; (2) major program tasks by year; (3) an itemization of major subcontracts[1] and equipment purchases; (4) an itemization of any information technology (IT) [2] purchase; (5) a summary of projected funding requirements by month; and (6) the source, nature, and amount of any industry cost-sharing. Where the effort consists of multiple portions which could reasonably be partitioned for purposes of funding, these should be identified as options with separate

[1] [1] To include similar cost breakdown as required by the offeror (prime).
[2] IT is defined as "any equipment, or interconnected system(s) or subsystem(s) of equipment, that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information by the agency. (a) For purposes of this definition, equipment is used by an agency if the equipment is used by the agency directly or is used by a contractor under a contract with the agency which – (1) Requires the use of such equipment; or (2) Requires the use, to a significant extent, of such equipment in the performance of a service or the furnishing of a product. (b) The term "information technology" includes computers, ancillary, software, firmware and similar procedures, services (including support services), and related resources. (c) The term "information technology" does not include – (1) Any equipment that is acquired by a contractor incidental to a contract; or (2) Any equipment that contains imbedded information technology that is used as an integral part of the product, but the principal function of which is not the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of data or information. For example, HVAC (heating, ventilation, and air conditioning) equipment such as thermostats or temperature control devices, and medical equipment where information technology is integral to its operation, are not information technology."

cost estimates for each. NOTE: for IT and equipment purchases, include a letter stating why the offeror cannot provide the requested resources from its own funding.

Supporting cost and pricing information in sufficient detail to substantiate the summary cost estimates in B. above. Include a description of the method used to estimate costs and supporting documentation. Note: "cost or pricing data" as defined in FAR Subpart 15.4 shall be required if the offeror is seeking a procurement contract award of $650,000 or greater unless the offeror request an exception from the requirement to submit cost of pricing data. "Cost or pricing data" are not required if the offeror proposes an award instrument other than a procurement contract (e.g., a grant, cooperative agreement, or other transaction.) Please also provide any Forward Pricing Rate Agreement, other such Approved Rate Information (e.g., Rate Memo's, etc.), or such other documentation that may assist in expediting negotiations (if not available, state so). All proprietary subcontractor proposal documentation of which cannot be uploaded to TFIMS shall be made immediately available to the Government, upon request, under separate cover (i.e., mail, electronic/email, etc.), either by the Proposer or by the subcontractor organization.

E. Submission Dates and Times

1. Industry Day

DARPA intends to hold an Industry Day in the Arlington, VA area on or about September 21, 2007. At this event, the goals of the BAA will be reviewed, and potential offerors will have the opportunity to meet with other potential offerors and form teams. DARPA anticipates that participation in some or all of the event will be restricted to Citizens of the United States of America or U.S. permanent residents ('Green Card' holders). Individuals and firms interested in attending the Industry Day should contact Alexis Zeiden at Alexis.Zeiden.ctr@DARPA.mil as soon as possible. DARPA reserves the right to limit the number of individuals attending from each organization, and the total number of individual attending.

2. Proposal Abstract Date

The proposal abstract must be submitted as outlined above before 4:00 p.m. local time (Arlington, VA) on October 3, 2007. Proposal abstracts received after this time and date may not be reviewed.

DARPA will respond to proposal abstracts with a recommendation to propose or not propose and the time and date for submission of a full proposal. Regardless of the recommendation, the decision to propose is the responsibility of the proposer.

Proposal abstracts will be reviewed as they are received. Early submissions of proposal abstracts and full proposals are strongly encouraged because selections may be made at any time during the evaluation process. DARPA will attempt to review proposal abstracts within thirty (30) calendar days after receipt and will allow proposers at least

thirty (30) calendar days after review of their proposal abstracts in order to complete and submit their proposals.

3. Full Proposal Date

All submitted proposals will be fully reviewed regardless of the disposition of the proposal abstract.

Proposers who submitted a proposal abstract must submit the full proposal, using the procedure outlined above, on or before the time specified in the DARPA's response to the proposal abstract.

Proposers not submitting proposal abstracts are required to submit full proposals on or before 4:00 p.m. local time (Arlington, VA) on November 14, 2007, using the procedure outlined above, in order to be considered during the initial evaluation phase. However, BAA 07-39 will remain open until 4:00 p.m. local time (Arlington, VA) on September 13, 2008. Proposals may be submitted at any time from issuance of this announcement until the BAA closes; however, offerors are warned that the likelihood of funding is greatly reduced for proposals submitted after the initial closing date deadline.

DARPA will acknowledge receipt of complete submissions via email and assign control numbers that should be used in all further correspondence regarding proposals.

Failure to comply with the submission procedures may result in the submission not being evaluated.

V. APPLICATION REVIEW INFORMATION

A. Evaluation Criteria

Evaluation of proposals will be accomplished through a scientific/technical review of each proposal using the following criteria, which are listed in descending order of relative importance: (a) Overall Scientific and Technical Merit; (b) Potential Contribution and Relevance to the DARPA Mission; (c) Plans and Capability to Accomplish Technology Transition; (d) Offeror's Capabilities and Related Experience; (e) Realism of the Proposed Schedule; and (f) Cost Realism. The following are descriptions of the above listed criteria:

Overall Scientific and Technical Merit
The technical approach of the offeror should address every aspect of the effort. In particular, the following items will be considered and evaluated: Revolutionary aspects of the approach; scientific and technical merit of proposed approach to research; soundness of proposed work; and probability of success.

Potential Contribution and Relevance to the DARPA Mission
The potential contributions of the proposed effort with relevance to the national technology base will be evaluated.

Plans and Capability to Accomplish Technology Transition
The offeror's plans and capability to transition the technology to the research, industrial, and operational military communities in such a way as to enhance U.S. defense, to include the extent to which intellectual property rights limitations creates a barrier to technology transition.

Offeror's Capabilities and/or Related Experience
The capabilities of the offeror to perform the stated work will be examined. In particular, the qualifications of the Principal Investigators will be considered. The range, depth, and mix of expertise of the offeror's key personnel will be evaluated to ensure that they are qualified in the theory and application of the technologies involved in the research, development, testing, and evaluation of the proposed computer systems(s) and technology.

Realism of Proposed Schedule
The offeror's ability to aggressively pursue performance metrics in the shortest timeframe and to accurately account for that timeframe will be evaluated.

Cost Realism
Cost will be evaluated to determine whether the offeror's estimate is realistic for the technical and management approach offered, as well as to determine the offeror's practical understanding of the effort. This will be principally measured by cost per labor-hour and number of labor-hours proposed. The evaluation criterion recognizes that undue

emphasis on cost may motivate offerors to propose low-risk ideas with minimum uncertainty and to staff the effort with junior personnel in order to be in a more competitive posture. DARPA/MTO discourages such cost strategies. Cost reduction approaches that will be received favorably include innovative management concepts that maximize direct funding for technology and limit diversion of funds into overhead.

After selection and before award the contracting officer will negotiate cost/price reasonableness.

Award(s) will be made to proposers whose proposals are determined to be the most advantageous to the Government, all factors considered, including the potential contributions of the proposed work to the overall research program and the availability of funding for the effort. Award(s) may be made to any proposer(s) whose proposal(s) is determined selectable regardless of its overall rating.

NOTE: PROPOSERS ARE CAUTIONED THAT EVALUATION RATINGS MAY BE LOWERED AND/OR PROPOSALS REJECTED IF SUBMITTAL INSTRUCTIONS ARE NOT FOLLOWED.

B. Review and Selection Process

It is the policy of DARPA to ensure impartial, equitable, comprehensive proposal evaluations and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals. Pursuant to FAR 35.016, the primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. In order to provide the desired evaluation, qualified Government personnel will conduct reviews and (if necessary) convene panels of experts in the appropriate areas.

Proposals will not be evaluated against each other since they are not submitted in accordance with a common work statement. DARPA's intent is to review proposals as soon as possible after they arrive; however, proposals may be reviewed periodically for administrative reasons. For evaluation purposes, a proposal is the document described in “Full Proposals”, Section IV.D.2. Other supporting or background materials submitted with the proposal will be considered for the reviewer's convenience only and not considered as part of the proposal.

Restrictive notices notwithstanding, proposals may be handled for administrative purposes by support contractors. These support contractors are prohibited from competition in DARPA technical research and are bound by appropriate non-disclosure requirements.

Subject to the restrictions set forth in FAR 37.203(d), input on technical aspects of the proposals may be solicited by DARPA from non-Government consultants /experts who are strictly bound by the appropriate non-disclosure requirements.

It is the policy of DARPA to treat all proposals as competitive information and to disclose their contents only for the purpose of evaluation. No proposals will be returned. Upon completion of the source selection process, the original of each proposal received will be retained at DARPA and all other copies will be destroyed.

VI. AWARD ADMINISTRATION INFORMATION

A. Award Notices

As soon as the evaluation of a proposal is complete, the offeror will be notified that 1) the proposal has been selected for funding pending contract negotiations, or 2) the proposal has not been selected. These official notifications will be sent via U. S. mail to the Technical POC identified on the proposal coversheet.

B. Administrative and National Policy Requirements

1. Security

The Government anticipates that proposals submitted under this BAA will be unclassified. In the event that a proposer chooses to submit a classified proposal or submit any documentation that may be classified, the following information is applicable.

Security classification guidance on a DD Form 254 will not be provided at this time since DARPA is soliciting ideas only. After reviewing the incoming proposals, if a determination is made that the award instrument may result in access to classified information, a DD Form 254 will be issued and attached as part of the award. Proposers choosing to submit a classified proposal must first receive permission from the Original Classification Authority to use their information in replying to this BAA. Applicable classification guide(s) should be submitted to ensure that the proposal is protected appropriately.

Classified submissions shall be in accordance with the following guidance:

Collateral Classified Information: Use classification and marking guidance provided by previously issued security classification guides, the Information Security Regulation (DoD 5200.1-R), and the National Industrial Security Program Operating Manual (DoD 5220.22-M) when marking and transmitting information previously classified by another original classification authority. Classified information at the Confidential and Secret level may only be mailed via U.S. Postal Service (USPS) Registered Mail or U.S. Postal Service Express Mail. All classified information will be enclosed in opaque inner and outer covers and double wrapped. The inner envelope shall be sealed and plainly marked with the assigned classification and addresses of both sender and addressee. The inner envelope shall be address to:

Defense Advanced Research Projects Agency
ATTN: Microsystems Technology Office
Reference: BAA 07-39
3701 North Fairfax Drive
Arlington, VA 22203-1714

The outer envelope shall be sealed with no identification as to the classification of its contents and addressed to:

Defense Advanced Research Projects Agency
Security & Intelligence Directorate, Attn: CDR
3701 North Fairfax Drive
Arlington, VA 22203-1714

All Top Secret materials should be hand carried via an authorized, two-person courier team to the DARPA CDR.

Special Access Program (SAP) Information: Contact the DARPA Special Access Program Central Office (SAPCO) 703-526-6614 for further guidance and instructions prior to transmitting SAP information to DARPA. Top Secret SAP, must be transmitted via approved methods for such material. Consult the DoD Overprint to the National Industrial Security Program Operating Manual for further guidance. Prior to transmitting SAP material, it is strongly recommended that you coordinate your submission with the DARPA SAPCO.

Sensitive Compartmented Information (SCI) Data: Contact the DARPA Special Security Office (SSO) at 703-812-1994/1984 or 703-248-7318 for the correct SCI courier address and instructions. All SCI should be transmitted through your servicing Special Security Officer (SSO). SCI data must be transmitted through SCI channels only (i.e., approved SCI Facility to SCI facility via secure fax).

Proprietary Data: All proposals containing proprietary data should have the cover page and each page containing proprietary data clearly marked as containing proprietary data. It is the Offeror's responsibility to clearly define to the Government what is considered proprietary data.

Offerors must have existing and in-place prior to execution of an award, approved capabilities (personnel and facilities) to perform research and development at the classification level they propose. It is the policy of DARPA to treat all proposals as competitive information, and to disclose their contents only for the purpose of evaluation. Proposals will not be returned. The original of each proposal received will be retained at DARPA and all other non-required copies destroyed. A certification of destruction may be requested, provided that the formal request is received at this office within 5 days after unsuccessful notification.

2. Intellectual Property

a. Procurement Contract Proposers

1. Noncommercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting a procurement contract to be issued under the FAR/DFARS, shall identify all noncommercial technical data, and noncommercial computer software that it plans to generate, develop, and/or deliver under any proposed award instrument in which the Government will acquire less than unlimited rights, and to assert specific restrictions on those deliverables. Proposers shall follow the format under DFARS 252.227-7017 for this stated purpose. In the event that proposers do not submit the list, the Government will assume that it automatically has "unlimited rights" to all noncommercial technical data and noncommercial computer software generated, developed, and/or delivered under any award instrument, unless it is substantiated that development of the noncommercial technical data and noncommercial computer software occurred with mixed funding. If mixed funding is anticipated in the development of noncommercial technical data, and noncommercial computer software generated, developed, and/or delivered under any award instrument, then proposers should identify the data and software in question, as subject to Government Purpose Rights (GPR). In accordance with DFARS 252.227-7013 Rights in Technical Data - Noncommercial Items, and DFARS 252.227-7014 Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation, the Government will automatically assume that any such GPR restriction is limited to a period of five (5) years in accordance with the applicable DFARS clauses, at which time the Government will acquire "unlimited rights" unless the parties agree otherwise. Proposers are admonished that the Government will use the list during the source selection evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. If no restrictions are intended, then the proposer should state "NONE."

A sample list for complying with this request is as follows:

NONCOMMERCIAL			
Technical Data Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

2. Commercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting a procurement contract to be issued under the FAR/DFARS, shall identify all commercial technical data, and commercial computer software that may be embedded in any noncommercial deliverables contemplated under the research effort, along with any applicable restrictions on the Government's use of such commercial technical data and/or commercial computer software. In the event that proposers do not submit the list, the Government will assume that there are no restrictions on the Government's use of such commercial items. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified

restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. If no restrictions are intended, then the proposer should state "NONE."

A sample list for complying with this request is as follows:

COMMERCIAL			
Technical Data Computer Software To be Furnished With Restrictions	Basis for Assertion	Asserted Rights Category	Name of Person Asserting Restrictions
(LIST)	(LIST)	(LIST)	(LIST)

b. NonProcurement Contract Proposers

1. Noncommercial Items (Technical Data and Computer Software)

Proposers responding to this BAA requesting a Grant, Cooperative Agreement, Technology Investment Agreement, or Other Transaction for Prototype shall follow the applicable rules and regulations governing these various award instruments, but in all cases should appropriately identify any potential restrictions on the Government's use of any Intellectual Property contemplated under those award instruments in question. This includes both Noncommercial Items and Commercial Items. Although not required, proposers may use a format similar to that described in Paragraphs 1.a and 1.b above. The Government may use the list during the source selection evaluation process to evaluate the impact of any identified restrictions, and may request additional information from the proposer, as may be necessary, to evaluate the proposer's assertions. If no restrictions are intended, then the proposer should state "NONE."

c. All Proposers – Patents

Include documentation proving your ownership of or possession of appropriate licensing rights to all patented inventions (or inventions for which a patent application has been filed) that will be utilized under your proposal for the DARPA program. If a patent application has been filed for an invention that your proposal utilizes, but the application has not yet been made publicly available and contains proprietary information, you may provide only the patent number, inventor name(s), assignee names (if any), filing date, filing date of any related provisional application, and a summary of the patent title, together with either: 1) a representation that you own the invention, or 2) proof of possession of appropriate licensing rights in the invention.

d. All Proposers-Intellectual Property Representations

Provide a good faith representation that you either own or possess appropriate licensing rights to all other intellectual property that will be utilized under your proposal for the DARPA program. Additionally, offerors shall provide a short summary for each item

asserted with less than unlimited rights that describes the nature of the restriction and the intended use of the intellectual property in the conduct of the proposed research.

3. Meeting and travel requirements

There will be a program kickoff meeting for each phase, and all key participants are required to attend. Performers should also anticipate periodic site visits at the Program Manager's discretion.

4. Human use

Proposals selected for contract award are required to comply with provisions of the Common Rule (32 CFR 219) on the protection of human subjects in research (http://www.dtic.mil/biosys/downloads/32cfr219.pdf) and the Department of Defense Directive 3216.2 (http://www.dtic.mil/whs/directives/corres/html2/d32162x.htm). All proposals that involve the use of human subjects are required to include documentation of their ability to follow Federal guidelines for the protection of human subjects. This includes, but is not limited to, protocol approval mechanisms, approved Institutional Review Boards, and Federal Wide Assurances. These requirements are based on expected human use issues sometime during the entire length of the proposed effort.

For proposals involving "greater than minimal risk" to human subjects within the first year of the project, performers must provide evidence of protocol submission to a federally approved IRB at the time of final proposal submission to DARPA. For proposals that are forecasted to involve "greater than minimal risk" after the first year, a discussion on how and when the offeror will comply with submission to a federally approved IRB needs to be provided in the submission. More information on applicable federal regulations can be found at the Department of Health and Human Services – Office of Human Research Protections website (http://www.dhhs.gov/ohrp/).
Any aspects of a proposal involving human use should be specifically called out as a separate element of the statement of work and cost proposal to allow for independent review and approval of those elements.

5. Animal Use

Any Recipient performing research, experimentation, or testing involving the use of animals shall comply with the rules on animal acquisition, transport, care, handling, and use in : (i) 9 CFR parts 1-4, Department of Agriculture rules that implement the Laboratory Animal Welfare Act of 1966, as amended, (7 U.S.C. 2131-2159); and (ii) the guidelines described in National Institutes of Health Publication No. 86-23, "Guide for the Care and Use of Laboratory Animals."

6. Publication approval

Offerors are advised if they propose grants or cooperative agreements, DARPA may elect to award other award instruments. DARPA will make this election if it determines that

the research resulting from the proposed program will present a high likelihood of disclosing performance characteristics of military systems or manufacturing technologies that are unique and critical to defense. Any resulting award will include a requirement for DARPA permission before publishing any information or results on the program.

The following provision will be incorporated into any resultant procurement contract or other transaction:

When submitting material for written approval for open publication as described in subparagraph (a) above, the Contractor/Awardee must submit a request for public release to the DARPA TIO and include the following information: 1) Document Information: document title, document author, short plain-language description of technology discussed in the material (approx. 30 words), number of pages (or minutes of video) and document type (briefing, report, abstract, article, or paper); 2) Event Information: event type (conference, principle investigator meeting, article or paper), event date, desired date for DARPA's approval; 3) DARPA Sponsor: DARPA Program Manager, DARPA office, and contract number; and 4) Contractor/Awardee's Information: POC name, e-mail and phone. Allow four weeks for processing; due dates under four weeks require a justification. Unusual electronic file formats may require additional processing time. Requests can be sent either via e-mail to tio@darpa.mil or via 3701 North Fairfax Drive, Arlington VA 22203-1714, telephone (571) 218-4235. Refer to www.darpa.mil/tio for information about DARPA's public release process.

7. Export Control

DARPA advises potential performers to carefully evaluate whether the output of their proposed projects will be subject to export restrictions. Performers should affirmatively state that they are able to process export restricted information, or indicate why they believe information generated to be except from export controls.

Should this project develop beyond fundamental research (basic and applied research ordinarily published and shared broadly within the scientific community) with military or dual-use applications the following apply:

(1) The Contractor shall comply with all U. S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract. In the absence of available license exemptions/exceptions, the Contractor shall be responsible for obtaining the appropriate licenses or other approvals, for obtaining the appropriate licenses or other approvals, if required, for exports of (including deemed exports) hardware, technical data, and software, or for the provision of technical assistance.

(2) The Contractor shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at any Government installation (whether in or outside

the United States), where the foreign person will have access to export-controlled technical data or software.

(3) The Contractor shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

(4) The Contractor shall be responsible for ensuring that the provisions of this clause apply to its subcontractors.

8. Subcontracting

Pursuant to Section 8(d) of the Small Business Act (15 U.S.C. 637(d)), it is the policy of the Government to enable small business and small disadvantaged business concerns to be considered fairly as subcontractors to contractors performing work or rendering services as prime contractors or subcontractors under Government contracts, and to assure that prime contractors and subcontractors carry out this policy. Each proposer who submits a contract proposal and includes subcontractors is required to submit a subcontracting plan in accordance with FAR 19.702(a) (1) and (2) should do so with their proposal. The plan format is outlined in FAR 19.704.

C. Reporting

The number and types of reports will be specified in the award document, but will include as a minimum monthly progress reports, and quarterly financial status reports. The reports shall be prepared and submitted in accordance with the procedures contained in the award document and mutually agreed on before award. Reports and briefing material will also be required as appropriate to document progress in accomplishing program metrics. A Final Report that summarizes the project and tasks will be required at the conclusion of the performance period for the award, notwithstanding the fact that the research may be continued under a follow-on vehicle.

1. Central Contractor Registration

Selected proposers not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to any award under this BAA. Information on CCR registration is available at http://www.ccr.gov.

2. Representations and Certifications

In accordance with FAR 4.1201, prospective proposers shall complete electronic annual representations and certifications at http://orca.bpn.gov.

3. Wide Area WorkFlow (WAWF)

Unless using another approved electronic invoicing system, performers will be required to submit invoices for payment directly via the Internet/WAWF at http://wawf.eb.mil. Registration to WAWF will be required prior to any award under this BAA.

VII. AGENCY CONTACTS

DARPA will use electronic mail for all technical and administrative correspondence regarding this BAA, with the exception of selected/not-selected notifications.

Administrative, technical or contractual questions should be sent via e-mail to John.Evans@darpa.mil. If e-mail is not available, fax questions to 703-248-1808, Attention: BAA 07-39. All requests must include the name, email address, and phone number of a point of contact.

John D. Evans, Ph.D., MBA
DARPA/MTO
ATTN: BAA 07-39
3701 North Fairfax Drive
Arlington, VA 22203-1714